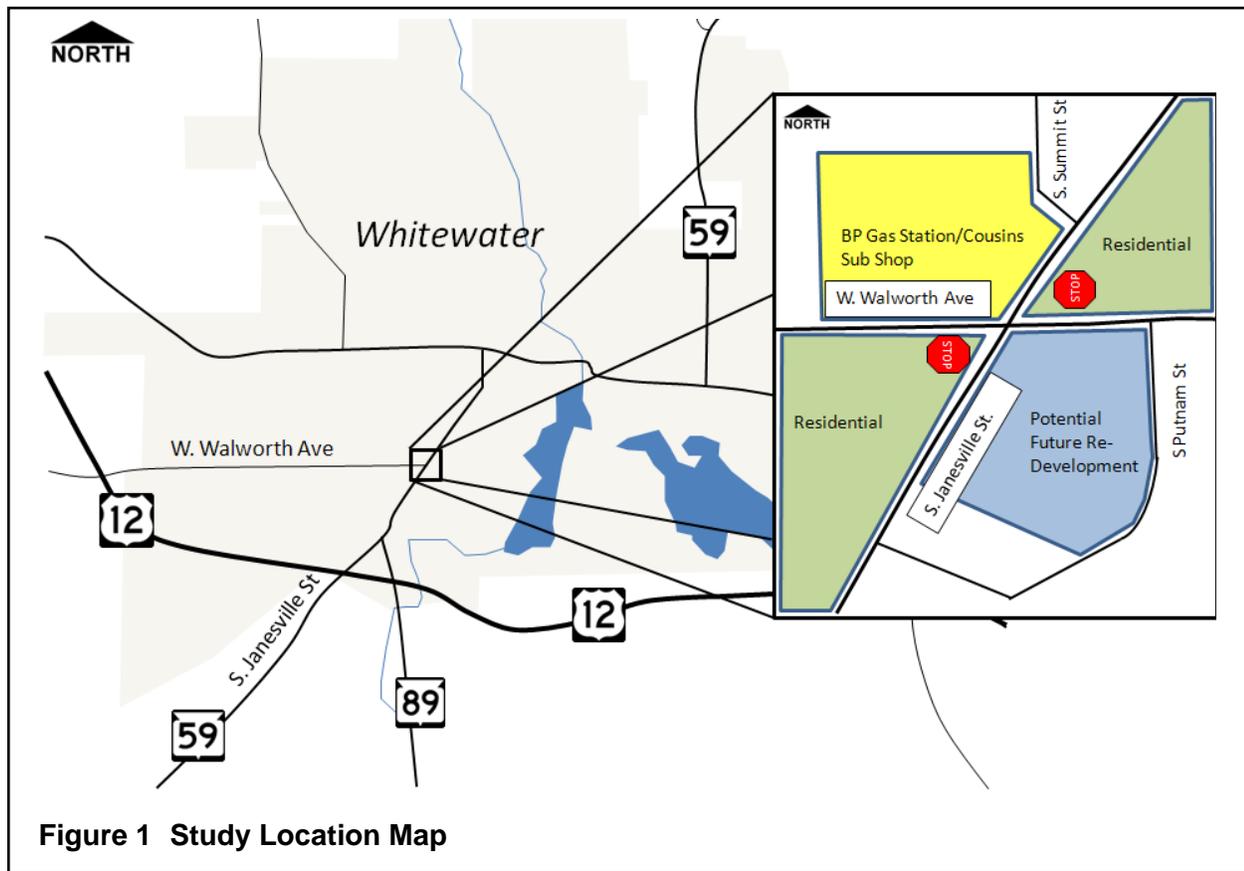


The City of Whitewater retained Strand Associates, Inc.[®] to evaluate traffic operations at the intersection of South Janesville Street with West Walworth Avenue and South Summit Street, also commonly known as the Five Points Intersection. The intersection is being studied to address several concerns, which include the following:

1. Access and mobility for vehicles
2. Pedestrian facilities
3. Vehicle operations
4. Access and mobility to nearby schools
5. Redevelopment potential in the southeast quadrant

As shown in Figure 1, this intersection is located approximately 0.75 miles southwest of downtown Whitewater.

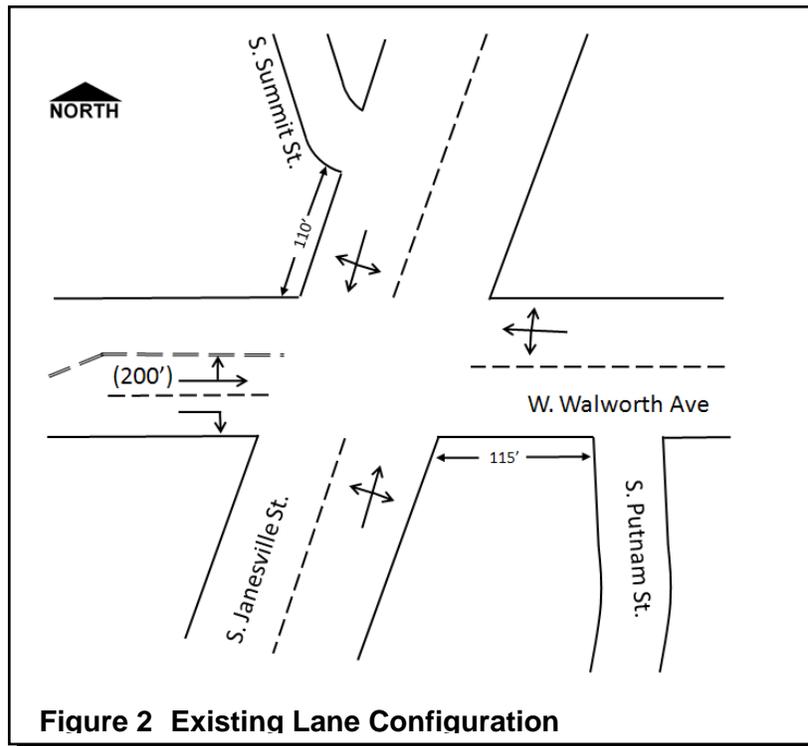


EXISTING CONDITIONS

The following describes the existing conditions of the intersection.

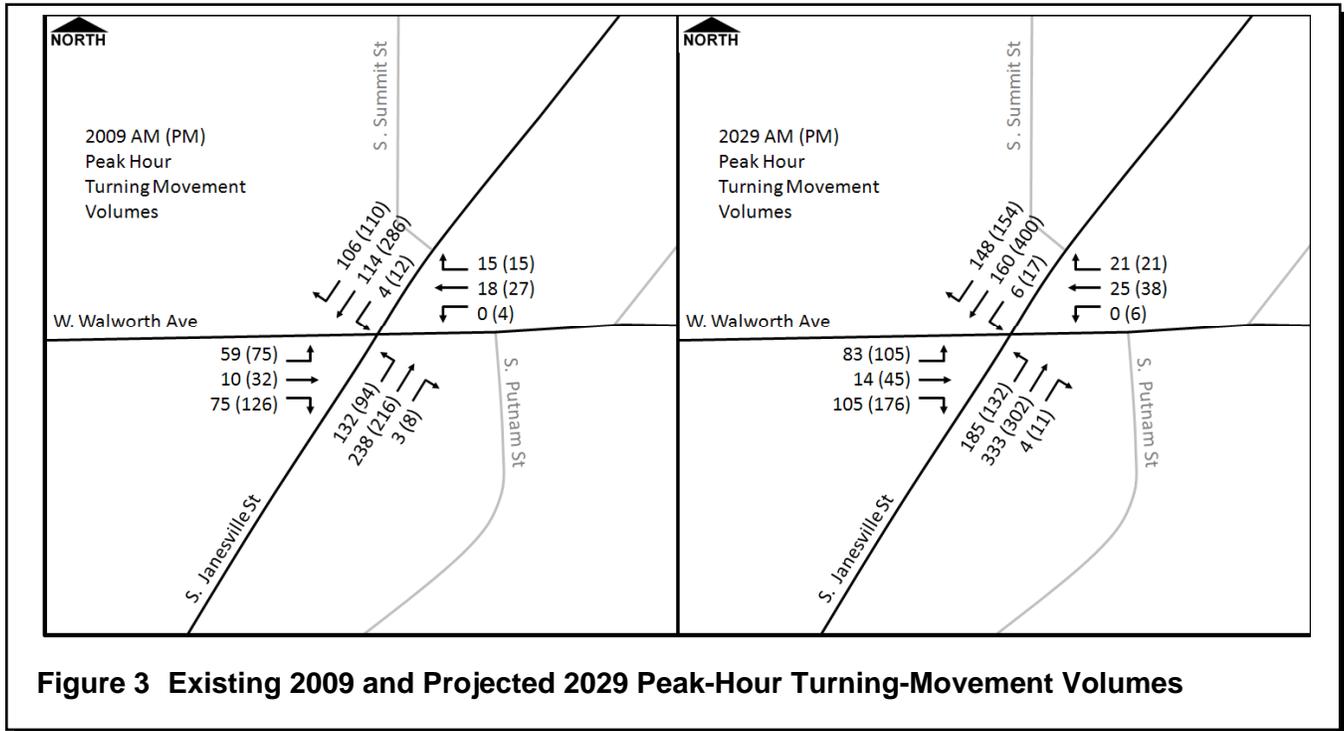
A. Geometry

Previously, the study intersection was a five-leg intersection. This was changed when South Summit Street was reconstructed in 2004 to tee into South Janesville Street immediately north of West Walworth Avenue eliminating one leg of the intersection. Today, South Janesville Street and West Walworth Avenue still intersect each other at approximately 55 degrees. West Walworth Avenue is stop-controlled while South Janesville Street is free-flowing. Eastbound West Walworth Avenue has a dedicated left/through lane. Figure 2 shows the existing lane configuration. South Putnam Street intersects West Walworth Avenue approximately 125 feet east of the Five Points Intersection and continues south where it connects back into South Janesville approximately 400 feet south of the Five Points Intersection.



B. Traffic Volumes

A 12-hour turning-movement traffic count was performed at the intersection on November 10 and 11, 2009. The raw count data is provided in Appendix D. The AM peak hour was determined to be from 7:15 to 8:15 A.M., while the PM peak hour occurred from 4:15 to 5:15 P.M. These peak-hour turning-movement volumes were increased by 2 percent per year to develop projected year 2029 peak-hour volumes. Figure 3 shows the existing 2009 and projected 2029 peak-hour turning-movement volumes.



The 2006 annual average daily traffic volumes were 7,800 along South Janesville Street north of the intersection, 6,900 south of the intersection, and 4,100 west of the intersection along West Walworth Avenue.

ALTERNATIVE DEVELOPMENT

Four long-term alternatives (signalization, two roundabout alternatives, and realignment of the intersection) and one interim alternative (multiway stop-control) were developed for the Five Points Intersection. The details of each alternative are discussed in this section and are shown in Appendix A.

A. Traffic Signals

Using existing count data, the following traffic signal warrants were evaluated:

1. Warrant 1: 8-Hour Signal Warrant
2. Warrant 2: 4-Hour Signal Warrant
3. Warrant 3: Peak-Hour Warrant

Based on this analysis, using both the 2009 and projected 2029 traffic volumes, none of the warrants were satisfied. Projecting the traffic volumes and assuming no significant changes in traffic patterns, it is estimated that the 4-hour traffic warrant might be satisfied in 2040 and the 8-hour warrant in 2054. Even though the traffic signals do not meet warrants, the traffic signal alternative may resolve some of the initial concerns at the intersection. Based on this and discussions with City of Whitewater staff, the traffic signal alternative was further analyzed to understand the possible traffic operations. Some of the advantages and disadvantages associated with this option include the following:

1. Advantages
 - a. Maintains the current geometry of the intersection.
 - b. Provides a signalized pedestrian crossing.
 - c. Yields acceptable future intersection operations.
 - d. Minimizes impacts to future redevelopment site in the southeast quadrant.
 - e. Maintains a rather high driver familiarity level.
2. Disadvantages
 - a. 4-hour warrant not met until 2040.
 - b. Statistics show that crash rates often increase with traffic signals.
 - c. 32 vehicle conflict points.
 - d. Does not provide physical control of intersection speeds. Red signal head is the only indication for reducing speed to a stop.
 - e. Increased delay and queue along South Janesville Street.

The traffic signal warrant analysis is provided in Appendix B.

B. Four-Leg Roundabout

This alternative maintains the existing four-leg intersection with only one leg, the westbound approach, requiring some realignment. Some of the advantages and disadvantages associated with this option include the following:

1. Advantages
 - a. Maintains the four-leg intersection.
 - b. Preliminary layout suggests there is less impact to the property in the northeast quadrant when compared to the realignment alternative.
 - c. Two-stage crossings are available to pedestrians on all approaches.
 - d. Reduces the vehicle conflict points from 32 to 8 when compared to a traditional intersection.
 - e. Provides physical control of intersection speeds (e.g., lighting, landscaping, central island, splitter islands).
2. Disadvantages
 - a. Contains a nontypical roundabout layout (oval shape).
 - b. Greater impacts to the potential redevelopment property along West Walworth Avenue east of South Janesville Street.
 - c. Eastbound and westbound trucks larger than WB-50 making right turns from West Walworth Avenue to South Janesville Street must circle the entire roundabout to complete the turn.
 - d. Roundabouts are often considered as having a low driver familiarity level.

After discussion with and review by city staff, the four-leg roundabout option was eliminated from further consideration.

C. Three-Leg Roundabout

This alternative shifts the new intersection south of its current location. The westbound approach will be rerouted onto South Putnam Street, resulting in a three-leg intersection. Some of the advantages and disadvantages associated with this option include the following:

1. Advantages
 - a. The resulting intersection is a tee-intersection.
 - b. Two-stage crossings are available to pedestrians on all approaches.
 - c. Preliminary layout suggests there is less impact to the property in the northeast quadrant than the realignment alternative.
 - d. Reduces the conflict points from 32 to 7.
 - e. Provides physical control of intersection speeds (e.g., lighting, landscaping, central island, splitter islands).

2. Disadvantages
 - a. It involves the possible reconstruction of South Putnam Street.
 - b. There is indirection for westbound vehicles on West Walworth Avenue going to northbound South Janesville Street; traffic must use South Putnam Street.
 - c. Eastbound trucks larger than WB-50 making right turns from West Walworth Avenue to South Janesville Street must circle the entire roundabout to complete the turn.
 - d. There is indirection for through traffic on West Walworth Avenue.
 - e. Roundabouts are often considered as having a low driver familiarity level.

After discussion with and review by city staff, this option was carried forward for further consideration. If this alternative was ultimately implemented, the City of Whitewater may want to consider realigning South Putnam Street to the east to provide a greater distance between the Five Points Intersection and South Putnam Street/Walworth Avenue intersection, which will also expand the area of the potential redevelopment site.

D. Intersection Realignment

This alternative shifts the new intersection south of its current location. The westbound approach to the intersection will be realigned to the north and connect to South Summit Street. Some of the advantages and disadvantages associated with this option include the following:

1. Advantages
 - a. Realignment still allows for free-flow traffic along South Janesville Street.
 - b. The roadways intersect at 90 degree angles.
 - c. Allows for signalization in the future.
 - d. It expands the distance between the West Walworth Avenue and South Summit Street intersections along South Janesville Street.
 - e. Minimizes impacts to the potential redevelopment site in the southeast quadrant.

2. Disadvantages
 - a. There are some impacts to properties in the northeast and southwest quadrants.
 - b. There is indirection for through traffic on West Walworth Avenue.
 - c. Two-stage crossing (median available) is available only at West Walworth Avenue.
 - d. Does not provide physical speed control on South Janesville Street.

After discussion with and review by city staff, this option was carried forward for further consideration. As mentioned in the previous alternative, South Putnam Street could be realigned to the east to provide a greater lot depth and to expand the potential redevelopment site.

E. Multiway Stop-control (Interim Alternative)

This alternative changes the existing two-way stop-control to multiway stop-control using the current intersection geometry and lane configurations. Based on current traffic counts, the intersection does not meet the minimum volumes for the multiway stop-control warrant. However, pending further review of crash information, multiway stop-control may be warranted at the intersection. For the warrant to be satisfied, section 2B.07 of the MUTCD indicates that: "The intersection must have 5 or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions." Some advantages and disadvantages associated with this option include the following:

1. Advantages
 - a. Maintains the current geometry of the intersection.
 - b. Allows for signalization in the future.
 - c. Relatively low-cost interim solution
 - d. Minimizes impacts to the potential redevelopment site in the southeast quadrant.
 - f. Provides for a controlled pedestrian crossing.
2. Disadvantages
 - a. Does not meet the minimum volumes for the multiway stop warrants.
 - b. Janesville Street no longer a free-flow movement.
 - c. Only provides acceptable operations until 2014 (LOS C).
 - d. Does not allow for two-stage pedestrian crossing.
 - g. Does not provide physical control of intersection speeds; stop signs are only speed control.

ALTERNATIVE EVALUATION

The operation of a roadway (level of congestion) is typically described as Level of Service (LOS). The LOS rating system describes the traffic flow conditions of a roadway or intersection and ranges from A (free-flow conditions) to F (over capacity). The following paragraphs describe the characteristics of LOS for intersections.

LOS is determined by the average delay, in seconds, of all vehicles entering an intersection. The average delay is based on the peak 15-minute period of the peak hour being analyzed. Since this delay is an average value, some vehicles will experience greater delay and some will experience less delay. Intersections with short average delays have good LOS; conversely, intersections with long average delays have poor LOS. Many municipalities consider LOS D the limit of acceptable delay, with LOS E accepted under certain circumstances. In the Facilities Development Manual (FDM), WisDOT indicates an acceptable LOS for principle arterials as LOS D. An LOS F for the total intersection is an indication that the demand (traffic volume) is greater than the capacity of the roadway or intersection.

| LOS | Signalized Intersection | Unsignalized Intersection |
|-----|-------------------------|---------------------------|
| A | <10 | <10 |
| B | 10 to 20 | 10 to 15 |
| C | 21 to 35 | 16 to 25 |
| D | 36 to 55 | 26 to 35 |
| E | 56 to 80 | 36 to 50 |
| F | > 80 | > 50 |

Table 1 Relationship Between LOS and Average Delay (In Seconds) at an Intersection

Typically, LOS is only calculated for the legs of an unsignalized intersection that have to yield to other movements (stop-control or left turns). RODEL, a roundabout modeling software, produces both signalized and unsignalized LOS. Typically, the unsignalized LOS is used for comparison since roundabout operations are similar to unsignalized intersections (e.g., vehicles yielding and seeking gaps in traffic.). Table 1 shows the LOS thresholds for both signalized and unsignalized intersections.

ALTERNATIVES ANALYSIS

The following discusses the current and future operations of the intersection with a signal, a three-leg roundabout, and intersection realignment alternative. These operations were also compared to the No Build alternative (existing geometrics with projected volumes).

A. No Build

The existing intersection geometry was modeled with both existing and projected 2029 peak-hour traffic volumes using Synchro modeling software. The results, shown in Table 2, indicate the intersection operates at LOS C during both peak periods in 2009 and LOS F during both peak periods in 2029.

| Intersection | Peak | | Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|----------------------------------|------------|------------|-----------|------------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | A (3.8 s) | A (0.2 s) | C (33.5 s) | (17.5 s) | C (33.5 s) |
| | | Queue | 12 ft | 0 ft | 48 ft | 11 ft | |
| | PM | LOS (delay) | A (3.1 s) | A (0.3 s) | C (29.5 s) | (18.2 s) | C (29.5 s) |
| | | Queue | 7 ft | 1 ft | 51 ft | 13 ft | |

| Intersection | Peak | | Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|----------------------------------|------------|-------------|-----------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | A (4.8 s) | A (0.2 s) | F (250.4 s) | (31.3 s) | F (250 s) |
| | | Queue | 19 ft | 0 ft | 213 ft | 30 ft | |
| | PM | LOS (delay) | A (3.8 s) | A (0.4 s) | F (193.2 s) | E (36 s) | F (193 s) |
| | | Queue | 12 ft | 1 ft | 227 ft | 39 ft | |

Table 2 2009 and 2029 Peak-Hour No Build Operations

B. Signalized Intersection

The existing geometry was modeled as a signal with both existing 2009 and projected 2029 peak-hour traffic volumes using Synchro modeling software. The results, shown in Table 3, indicate the intersection operates at LOS A during both peak periods in 2009 and LOS A and LOS B during the AM and PM peak periods in 2029, respectively.

| Intersection | Peak | | Existing 2009 Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|--|------------|------------|------------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | A (6.3 s) | A (4.6 s) | B (19.2 s) | B (18.2 s) | A (8.6 s) |
| | | Queue | 120 ft | 45 ft | 35 ft | 20 ft | |
| | PM | LOS (delay) | A (5.7 s) | A (5.7 s) | B (14.1 s) | B (13.3 s) | A (8.0 s) |
| | | Queue | 90 ft | 100 ft | 40 ft | 25 ft | |

| Intersection | Peak | | Future 2029 Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|--|------------|------------|------------|------------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | A (10 s) | A (4.6 s) | C (25.3 s) | C (23.0 s) | B (11.6 s) |
| | | Queue | 265 ft | 75 ft | 75 ft | 35 ft | |
| | PM | LOS (delay) | A (6.6 s) | A (6.3 s) | B (17.5 s) | B (16.0 s) | A (9.3 s) |
| | | Queue | 185 ft | 190 ft | 75 ft | 40 ft | |

Table 3 2009 and 2029 Peak-Hour Operations (Traffic Signal Alternative)

C. Three-Leg Roundabout

The three-leg roundabout alternative was modeled with both existing 2009 and projected 2029 peak-hour traffic volumes using RODEL roundabout analysis software. The results, shown in Table 4, indicate that each approach will perform at LOS A during both peak hours in 2009 and in 2029.

| Intersection | Peak | | Existing 2009 Operating Conditions by Approach | | | |
|--|------|-------------|--|------------|-----------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound |
| South Janesville Street and West Walworth Avenue | AM | LOS (delay) | A (4.6 s) | A (3.8 s) | A (3.6 s) | |
| | | Queue | 15 ft | 10 ft | 5 ft | |
| | PM | LOS (delay) | A (4.4 s) | A (4.9 s) | A (4.5 s) | |
| | | Queue | 15 ft | 20 ft | 10 ft | |

| Intersection | Peak | | Future 2029 Operating Conditions by Approach | | | |
|--|------|-------------|--|------------|-----------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound |
| South Janesville Street and West Walworth Avenue | AM | LOS (delay) | A (5.9 s) | A (4.3 s) | A (4 s) | |
| | | Queue | 30 ft | 15 ft | 10 ft | |
| | PM | LOS (delay) | A (5.5 s) | A (6.7 s) | A (5.7 s) | |
| | | Queue | 20 ft | 40 ft | 15 ft | |

Table 4 2009 and 2029 Peak-Hour Operations (Three-Leg Roundabout Alternative)

D. Intersection Realignment

The realigned intersection alternative was modeled with both existing 2009 and projected 2029 peak-hour traffic volumes using Synchro traffic modeling software. The results, shown in Table 5, indicate the eastbound approach operates at LOS C during both peak hours during 2009, but worsen to LOS E and F in 2029. Signalizing this intersection would improve these 2029 operations to LOS A during the AM and PM peak periods.

| Intersection | Peak | | Existing 2009 Operating Conditions by Approach | | | |
|--|------|-------------|--|------------|------------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound |
| South Janesville Street and West Walworth Avenue | AM | LOS (delay) | A (3.0 s) | A (0 s) | C (17.3 s) | |
| | | Queue | 15 ft | 0 ft | 35 ft | |
| | PM | LOS (delay) | A (2.6 s) | A (0 s) | C (17.0 s) | |
| | | Queue | 10 ft | 0 ft | 40 ft | |

| Intersection | Peak | | Future 2029 Operating Conditions by Approach | | | |
|--|------|-------------|--|------------|------------|-----------|
| | | | Northbound | Southbound | Eastbound | Westbound |
| South Janesville Street and West Walworth Avenue | AM | LOS (delay) | A (3.3 s) | A (0 s) | F (53.5 s) | |
| | | Queue | 25 ft | 0 ft | 140 ft | |
| | PM | LOS (delay) | A (2.9 s) | A (0 s) | E (47.5 s) | |
| | | Queue | 15 ft | 0 ft | 155 ft | |

Table 5 2009 and 2029 Peak-Hour Operations (Realigned Intersection Alternative)

E. Multiway Stop-Control (Interim Alternative)

The multiway stop-control was modeled with both existing 2009 and projected 2014 traffic volumes using Synchro traffic modeling software utilizing the existing intersection geometry and lane configurations. The results, shown in Table 6, indicate that the intersection operates at LOS C during both peak hours during 2009 and 2014, but the AM peak worsens to LOS D when projected to 2015. During the 2014 AM peak period, the northbound and southbound approaches experience queues of 270 feet and 85 feet, respectively. During the PM peak, the northbound approach experienced queuing of 130 feet and southbound approach experienced queuing 255 feet. With the addition of minor improvements, which include exclusive northbound left-only and southbound right-only lanes, the existing intersection could operate at an acceptable LOS for an additional 10 years (2024).

| Intersection | Peak | | Existing 2009 Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|--|------------|-----------|------------|------------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | C (18.5 s) | B (11.5 s) | A (9.5 s) | A (9.7 s) | C (18.5 s) |
| | | Queue | 190 ft | 65 ft | 55 ft | 45 ft | |
| | PM | LOS (delay) | B (14.0 s) | C (16.0 s) | A (9.9 s) | B (10.0 s) | C (16.0 s) |
| | | Queue | 130 ft | 155 ft | 65 ft | 35 ft | |

| Intersection | Peak | | Future 2014 Operating Conditions by Approach | | | | Overall |
|---------------------------------------|------|-------------|--|------------|------------|------------|------------|
| | | | Northbound | Southbound | Eastbound | Westbound | |
| Janesville Street and Walworth Avenue | AM | LOS (delay) | C (24.2 s) | B (12.8 s) | B (10.0 s) | B (10.1 s) | C (24.2 s) |
| | | Queue | 270 ft | 85 ft | 55 ft | 35 ft | |
| | PM | LOS (delay) | C (16.4 s) | C (20.1 s) | B (10.7 s) | B (10.6 s) | C (20.1 s) |
| | | Queue | 130 ft | 255 ft | 65 ft | 35 ft | |

Table 5 2009 and 2029 Peak-Hour Operations (Multiway Stop-Control Alternative)

ALTERNATIVE OPINIONS OF PROBABLE CONSTRUCTION COST

Opinions of probable construction cost were developed for each of the alternatives and are provided in Appendix C. These costs exclude utility relocations and right-of-way acquisition.

A. No Build

There are no costs associated with the No Build Alternative.

B. Traffic Signal

The opinion of probable construction cost for signaling the current intersection is approximately \$195,000. This cost also includes some minor curb and gutter and sidewalk modifications.

C. Three-Leg Roundabout

The opinion of probable construction cost for the three-leg roundabout option is approximately \$400,000. This cost does not include reconstruction of South Putnam Street between South Janesville Street and West Walworth Avenue.

D. Intersection Realignment

The opinion of probable construction cost for the realignment of the intersection of South Janesville Street and West Walworth Avenue is approximately \$445,000. This cost includes the construction of a new intersection between West Walworth Avenue and South Summit Street along South Janesville Street but does not include reconstruction of South Putnam Street.

E. Multiway Stop-Control

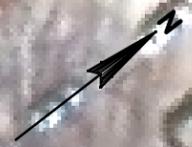
The opinion of probable construction cost for the multiway stop-controlled option is approximately \$5,000. This cost includes the cost for the new signage and pavement markings at the intersection.

CONCLUSIONS

Operations modeling indicates the three-leg roundabout option appears to yield the most favorable operations in future-year peak-hour conditions. Although not warranted, the traffic signal alternative yields acceptable LOS at a lower cost when compared to the other long-term alternatives. The traffic signal alternative also appears to minimize impacts to private properties at the intersection. Operations modeling indicates the interim multiway stop alternative yields acceptable operations through 2014 and implementing the interim alternative does not preclude the ability to expand to another alternative in the future.

**APPENDIX A
INTERSECTION ALTERNATIVES**

CONCEPTUAL
12/30/09

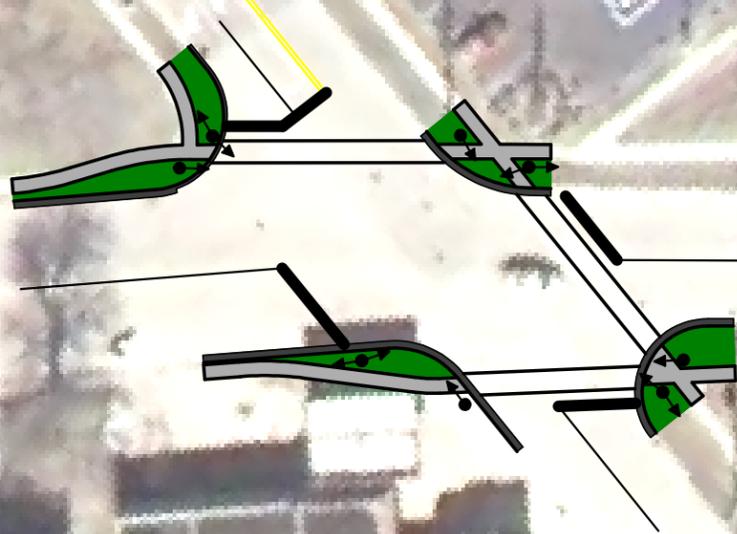


W. WALWORTH AVE.

S. SUMMIT ST.

S. JANESVILLE ST.

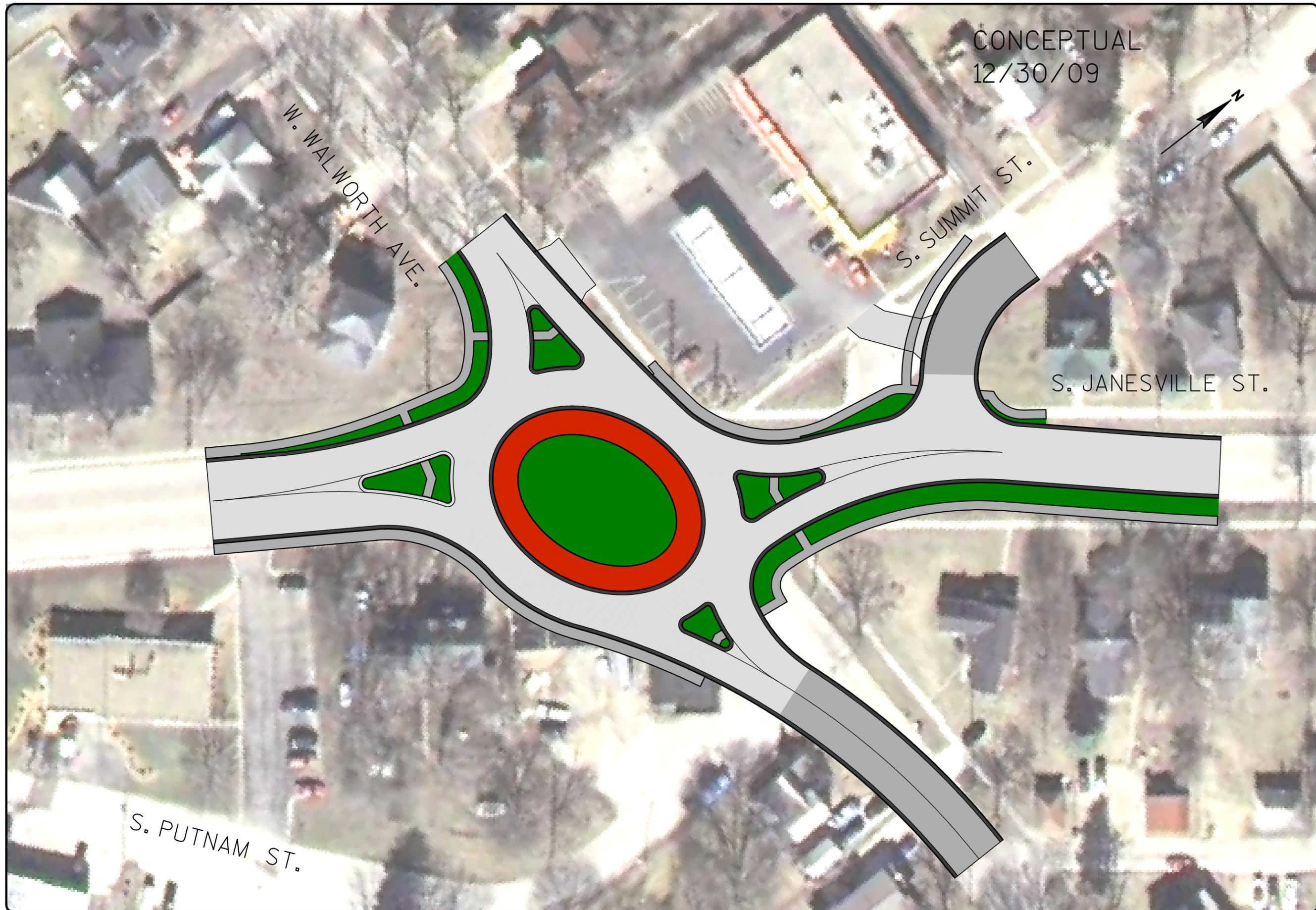
S. PUTNAM ST.



FIVE POINT - SIGNAL ALTERNATIVE

CITY OF WHITEWATER





CONCEPTUAL
12/30/09

W. WALWORTH AVE.

S. SUMMIT ST.

S. JANESVILLE ST.

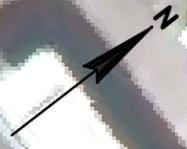
S. PUTNAM ST.

FIVE POINT - ROUNDABOUT OPTION - 4-LEG

CITY OF WHITEWATER



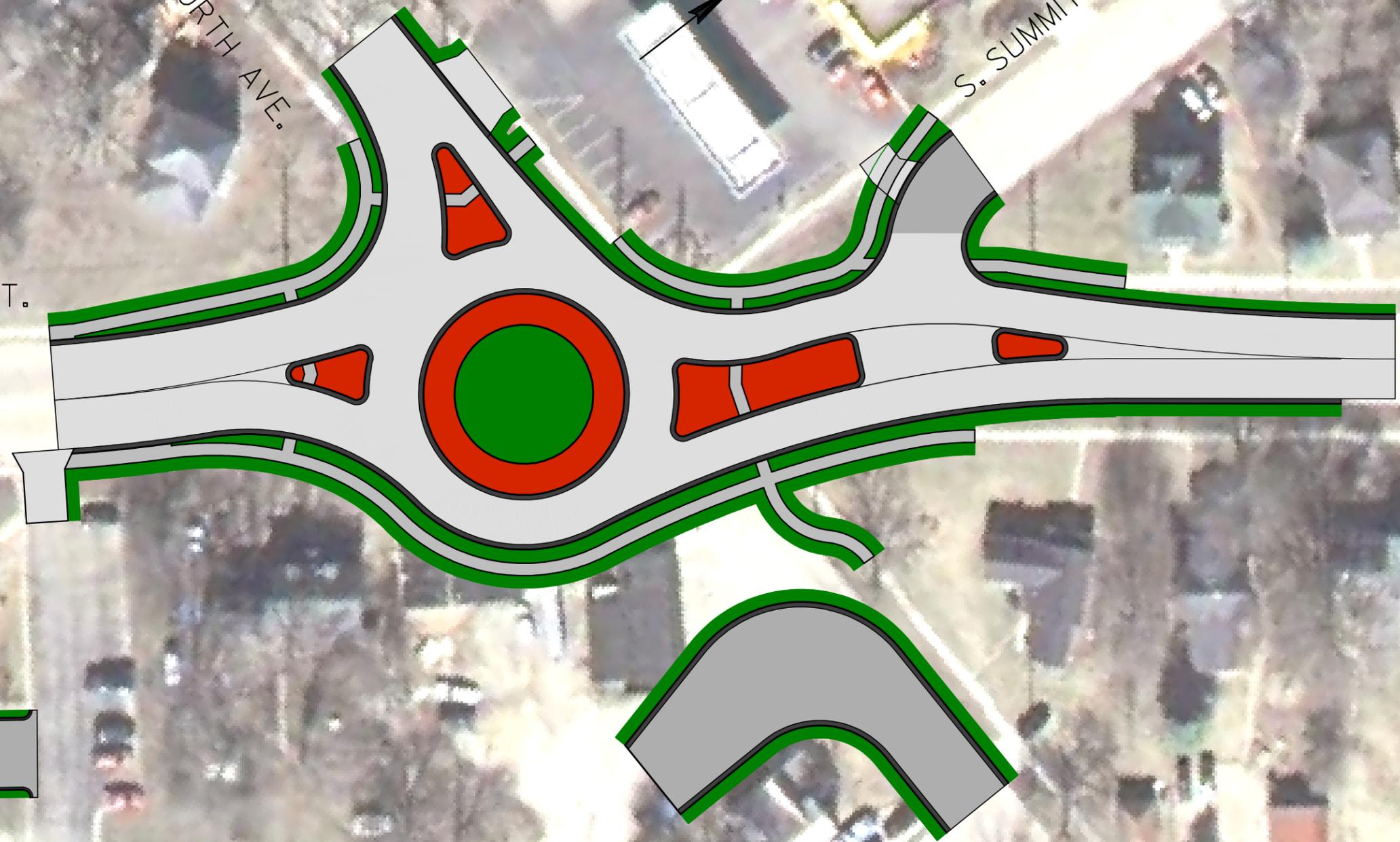
CONCEPTUAL
12/30/09



W. WALWORTH AVE.

S. SUMMIT ST.

S. JANESVILLE ST.

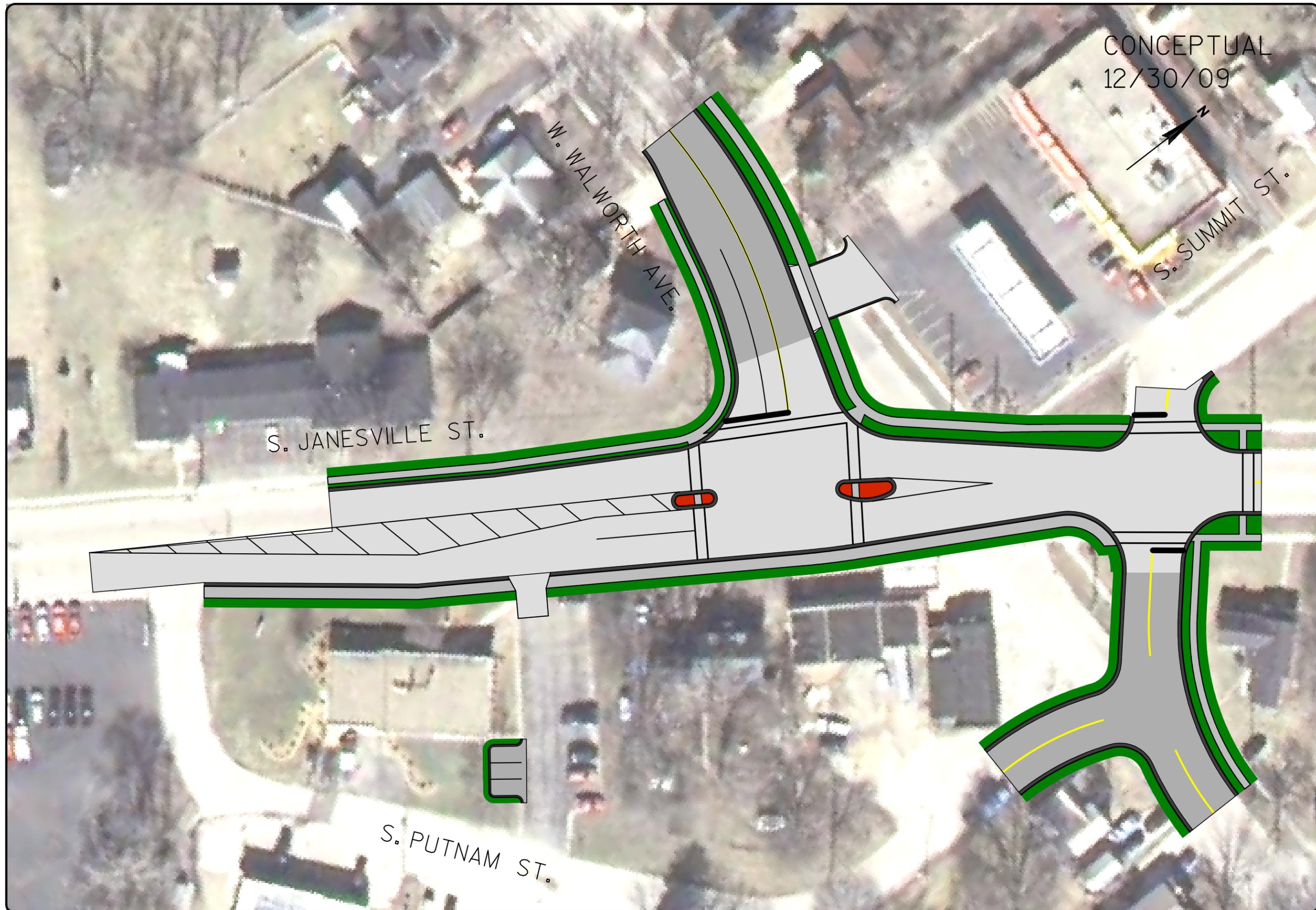


S. PUTNAM ST.

FIVE POINT - ROUNDABOUT OPTION - 3-LEG

CITY OF WHITEWATER





CONCEPTUAL
12/30/09



FIVE POINT - INTERSECTION REALIGNMENT OPTION

CITY OF WHITEWATER



CONCEPTUAL
3/8/2010



W. WALWORTH AVE.

S. SUMMIT ST.

S. JANESVILLE ST.

S. PUTNAM ST.



FIVE POINT - MULTI-WAY STOP CONTROL (INTERIM ALTERNATIVE)

CITY OF WHITEWATER



APPENDIX B
SIGNAL WARRANTS

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: Yes No
Satisfied: Yes No

*Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.*

Condition A - Minimum Vehicular Volume

100% Satisfied: Yes No
80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|----------------------------------|---|--------------|--------------|--------------|---------------------|-----|-----------|-----|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 500 (400) | 350 (280) | 600 (480) | 420 (335) | 704 | 683 | 630 | 598 | 581 | 501 | 456 | 397 | | | | | | | | | |
| Highest Approach on Minor Street | 150 (120) | 105 (85) | 200 (160) | 140 (110) | 85 | 106 | 94 | 66 | 57 | 63 | 53 | 47 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: Yes No
Excessive Delay: Yes No
100% Satisfied: Yes No
80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|----------------------------------|---|--------------|--------------|--------------|---------------------|-----|-----------|-----|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 750 (600) | 525 (420) | 900 (720) | 630 (505) | 704 | 683 | 630 | 598 | 581 | 501 | 456 | 397 | | | | | | | | | |
| Highest Approach on Minor Street | 75 (60) | 53 (40) | 100 (80) | 70 (55) | 85 | 106 | 94 | 66 | 57 | 63 | 53 | 47 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

% Right Turns Included: 100 on north approach 0 on east approach
100 on south approach 0 on west approach

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

- 1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
- 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

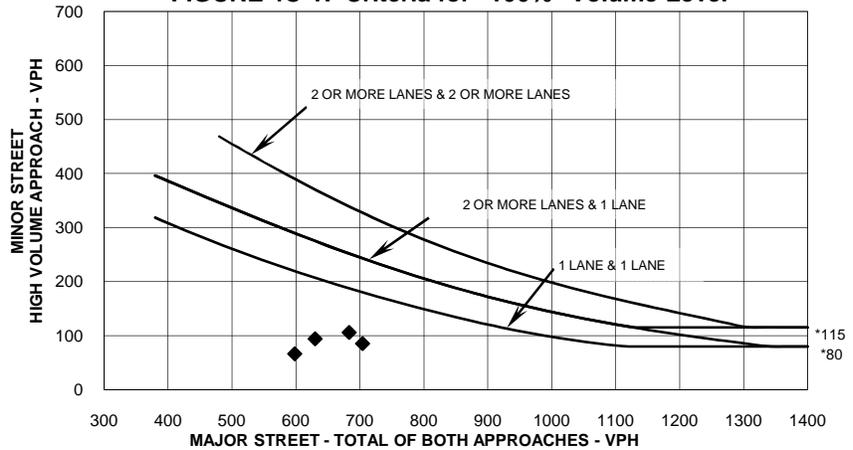
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Applicable: Yes No
Satisfied: Yes No

If all four points lie above the appropriate line, then the warrant is satisfied.

Plot four volume combinations on the applicable figure below.

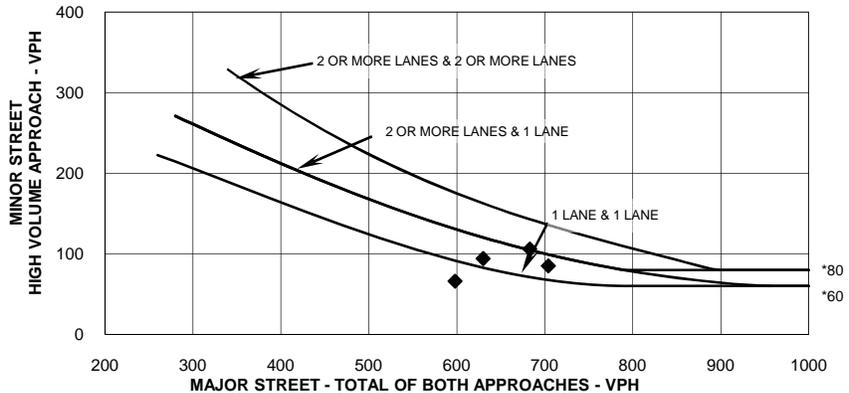
FIGURE 4C-1: Criteria for "100%" Volume Level



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

| Four Highest Hours | Volumes | |
|--------------------|--------------|--------------|
| | Major Street | Minor Street |
| 3:00 PM - 4:00 PM | 704 | 85 |
| 4:00 PM - 5:00 PM | 683 | 106 |
| 5:00 PM - 6:00 PM | 630 | 94 |
| 7:00 AM - 8:00 AM | 598 | 66 |

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: Yes No
Satisfied: Yes No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

| Peak Hour | | |
|-----------|-----|----|
| 3:00 PM | 704 | 85 |

Criteria

1. Delay on Minor Approach *(vehicle-hours)

| | | |
|-----------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Delay Criteria* | 4.0 | 5.0 |
| Delay* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

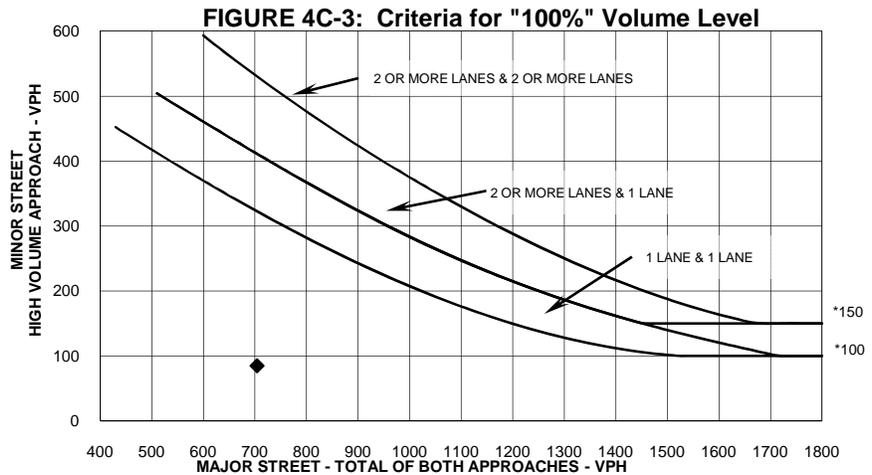
2. Volume on Minor Approach *(vehicles per hour)

| | | |
|------------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Volume Criteria* | 100 | 150 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

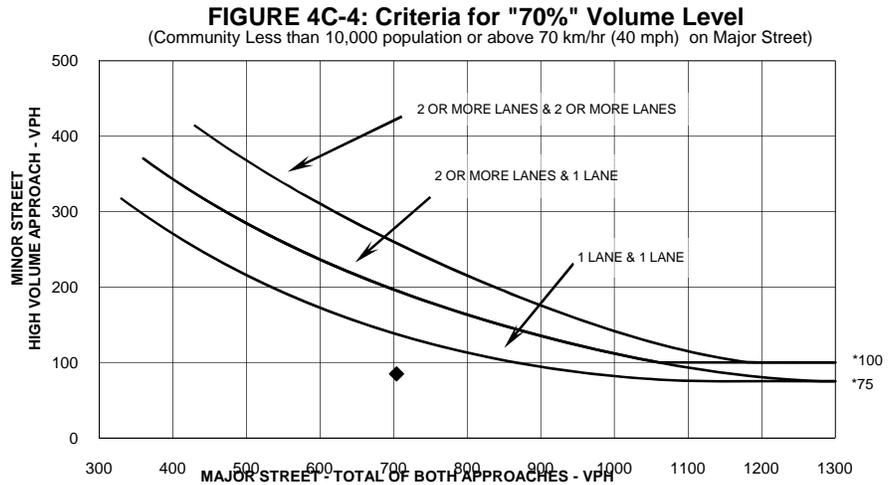
3. Total Entering Volume *(vehicles per hour)

| | | |
|-------------------|------------------------------|-----------------------------|
| No. of Approaches | 3 | 4 |
| Volume Criteria* | 650 | 800 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Plot volume combination on the applicable figure below.



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: Yes No
Satisfied: Yes No

| Criteria | Hour | Pedestrian Volume | Pedestrian Gaps | Fulfilled? | |
|--|------|-------------------|-----------------|------------|----|
| | | | | Yes | No |
| 1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | | | | |

WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
Satisfied: Yes No

| Criteria | Fulfilled? | | | |
|--|------------|-------|--|--|
| | Yes | No | | |
| 1. There are a minimum of 20 students crossing the major street during the highest crossing hour. | Students: | Hour: | | |
| 2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period. | Minutes: | Gaps: | | |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | | | |

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: Yes No
Satisfied: Yes No

| Criteria | Fulfilled? | |
|--|------------|----|
| | Yes | No |
| 1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning. | | |
| 2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation. | | |

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
Satisfied: Yes No

| Criteria | Hour | Volume | Met? | | Fulfilled? | | |
|---|---|--------|------|----|------------|----|--|
| | | | Yes | No | Yes | No | |
| 1. One of the warrants to the right is met. | Warrant 1, Condition A (80% satisfied) | | | | | | |
| | Warrant 1, Condition B (80% satisfied) | | | | | | |
| | Warrant 4, Pedestrian Volume at 80% of volume requirements: 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour | | | | | | |
| | | | | | | | |
| 2. Adequate trial of other remedial measure has failed to reduce crash frequency. | Measure tried: | | | | | | |
| 3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period. | Number of crashes per 12 months: | | | | | | |

WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: Yes No
Satisfied: Yes No

| Criteria | Met? | | | Fulfilled? | | |
|--|---|------------------|-----|------------|----------|--|
| | Yes | No | Yes | No | No | |
| 1. Both of the criteria to the right are met. | a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour. | Entering Volume: | | | | |
| | b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3. | Warrant: | 1 | 2 | 3 | |
| 2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.) | | | | | ← Hour | |
| | | | | | ← Volume | |

| Characteristics of Major Routes | Met? | | Fulfilled? | |
|--|---------------|----|------------|----|
| | Yes | No | Yes | No |
| 1. Part of the street or highway system that serves as the principal roadway network for through traffic flow. | Major Street: | | | |
| | Minor Street: | | | |
| 2. Rural or suburban highway outside of, entering, or traversing a city. | Major Street: | | | |
| | Minor Street: | | | |
| 3. Appears as a major route on an official plan. | Major Street: | | | |
| | Minor Street: | | | |

CONCLUSIONS

Warrants Satisfied:

Remarks: _____

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

Engineer: Gregory Bubolz
Date: November 18, 2009

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Left-Turn Conflict Analysis

Condition satisfied when the product of the mainline left turns in one direction and the opposing traffic exceed the thresholds given.

NOTE: This is not a signal warrant.

Applicable: Yes No
Satisfied: Yes No

| No. of Left-Turn Lanes | A Peak Volume Left Turns | No. of Opposing Lanes | B Peak Opposing Volume in Same Hour | Product of peak left-turning vehicles (A) and opposing plus right-turn vehicles (B) | | Exceeded? | |
|------------------------|-----------------------------|-----------------------|--|---|-----------|--------------------------|--------------------------|
| | | | | A x B | Threshold | Yes | No |
| 1 | | 1 | | 0 | 80,000 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 | | 2 | | 0 | 100,000 | <input type="checkbox"/> | <input type="checkbox"/> |

FOUR-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2010 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010

Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: Yes No
 Satisfied: Yes No

*Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.*

Condition A - Minimum Vehicular Volume

100% Satisfied: Yes No
 80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|-------------------------------------|---|--------------|--------------|--------------|---------------------|-------|-----------|-----|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 500 (400) | 350 (280) | 600 (480) | 420 (335) | 1,140 | 1,106 | 1,021 | 969 | 941 | 812 | 739 | 643 | | | | | | | | | |
| Highest Approach on Minor Street | 150 (120) | 105 (85) | 200 (160) | 140 (110) | 138 | 172 | 152 | 107 | 92 | 102 | 86 | 76 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: Yes No
 Excessive Delay: Yes No
 100% Satisfied: Yes No
 80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|-------------------------------------|---|--------------|--------------|--------------|---------------------|-------|-----------|-----|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 750 (600) | 525 (420) | 900 (720) | 630 (505) | 1,140 | 1,106 | 1,021 | 969 | 941 | 812 | 739 | 643 | | | | | | | | | |
| Highest Approach on Minor Street | 75 (60) | 53 (40) | 100 (80) | 70 (55) | 138 | 172 | 152 | 107 | 92 | 102 | 86 | 76 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

% Right Turns Included: 100 on north approach 0 on east approach
 100 on south approach 0 on west approach

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

YEAR: 2010

Engineer: Cara Abts
Date: February 2, 2010

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

- 1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 - 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

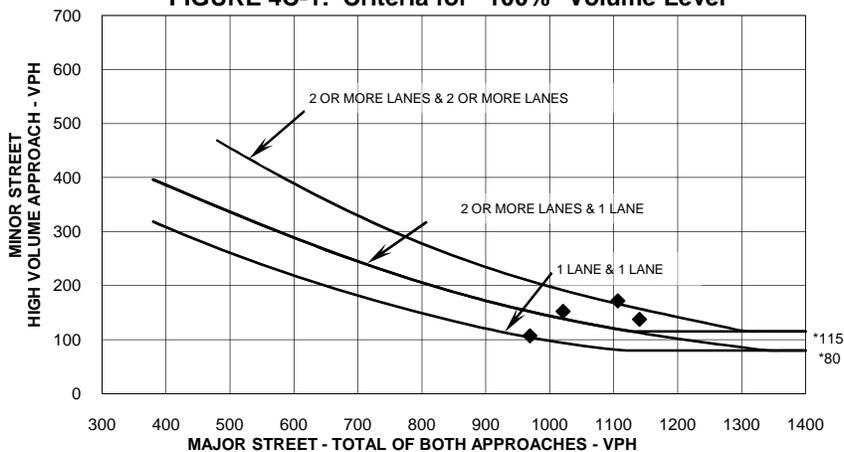
If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: Yes No
Satisfied: Yes No

Plot four volume combinations on the applicable figure below.

| Four Highest Hours | Volumes | |
|--------------------|--------------|--------------|
| | Major Street | Minor Street |
| 3:00 PM - 4:00 PM | 1,140 | 138 |
| 4:00 PM - 5:00 PM | 1,106 | 172 |
| 5:00 PM - 6:00 PM | 1,021 | 152 |
| 7:00 AM - 8:00 AM | 969 | 107 |

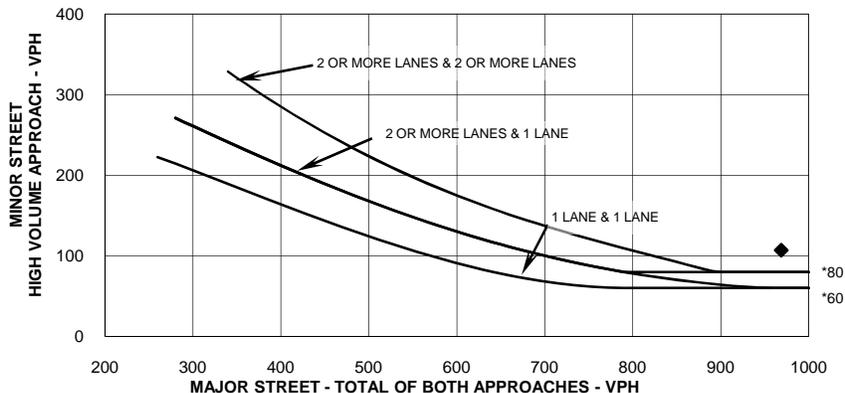
FIGURE 4C-1: Criteria for "100%" Volume Level



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FOUR-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

YEAR: 2010

Engineer: Cara Abts
Date: February 2, 2010

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: Yes No
Satisfied: Yes No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

| Peak Hour | | |
|-----------|-------|-----|
| 3:00 PM | 1,140 | 138 |

Criteria

1. Delay on Minor Approach *(vehicle-hours)

| | | |
|-----------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Delay Criteria* | 4.0 | 5.0 |
| Delay* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

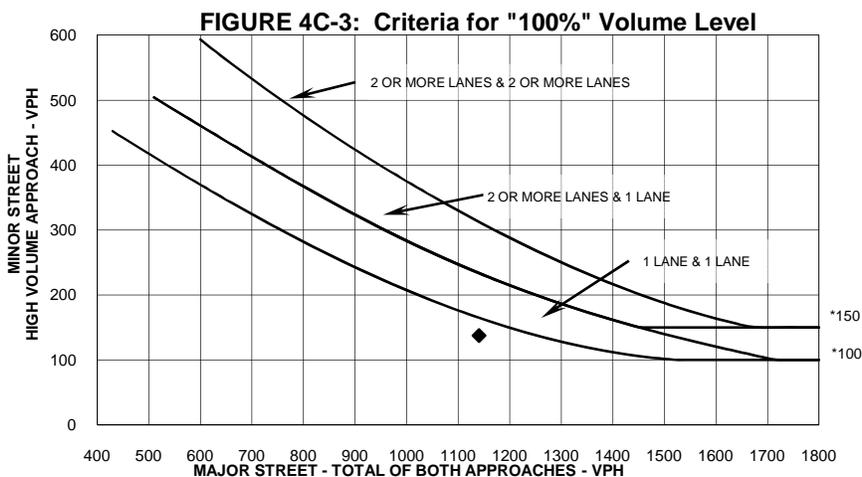
2. Volume on Minor Approach *(vehicles per hour)

| | | |
|------------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Volume Criteria* | 100 | 150 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

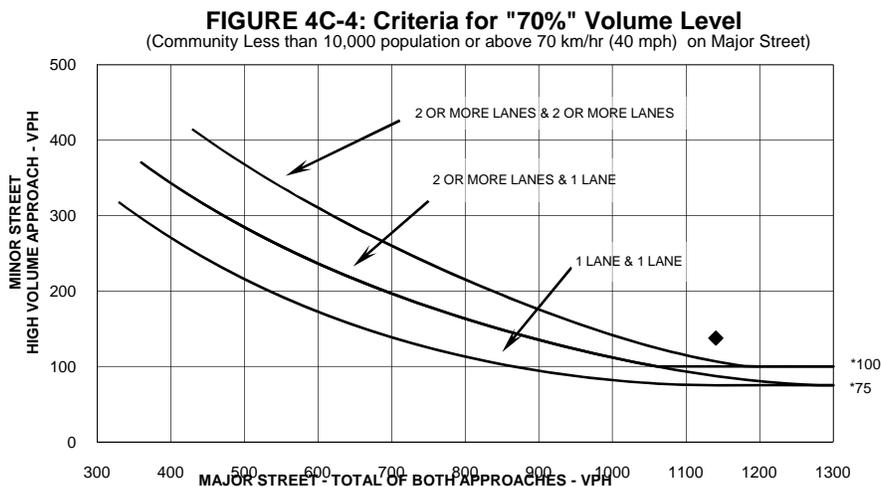
3. Total Entering Volume *(vehicles per hour)

| | | |
|-------------------|------------------------------|-----------------------------|
| No. of Approaches | 3 | 4 |
| Volume Criteria* | 650 | 800 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Plot volume combination on the applicable figure below.



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

FOUR-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2040 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010

Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Hour | Pedestrian Volume | Pedestrian Gaps | Fulfilled? | |
|--|------|-------------------|-----------------|------------|----|
| | | | | Yes | No |
| 1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | | | | |

WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Fulfilled? | | | |
|--|------------|-------|--|--|
| | Yes | No | | |
| 1. There are a minimum of 20 students crossing the major street during the highest crossing hour. | Students: | Hour: | | |
| 2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period. | Minutes: | Gaps: | | |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | | | |

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Fulfilled? | |
|--|------------|----|
| | Yes | No |
| 1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning. | | |
| 2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation. | | |

FOUR-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2040 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010
 Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Hour | Volume | Met? | | Fulfilled? | |
|---|---|--------|------|----|------------|----|
| | | | Yes | No | Yes | No |
| 1. One of the warrants to the right is met. | Warrant 1, Condition A (80% satisfied) | | | | | |
| | Warrant 1, Condition B (80% satisfied) | | | | | |
| | Warrant 4, Pedestrian Volume at 80% of volume requirements: | | | | | |
| | 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour | | | | | |
| 2. Adequate trial of other remedial measure has failed to reduce crash frequency. | Measure tried: | | | | | |
| 3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period. | Number of crashes per 12 months: | | | | | |

WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Met? | | | Fulfilled? | |
|--|---|----|------------------|------------|----|
| | Yes | No | Yes | No | No |
| 1. Both of the criteria to the right are met. | a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour. | | Entering Volume: | | |
| | b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3. | | Warrant: | 1 | 2 |
| 2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.) | | | | ← Hour | |
| | | | | ← Volume | |

| Characteristics of Major Routes | Met? | | Fulfilled? | |
|--|---------------|----|------------|----|
| | Yes | No | Yes | No |
| 1. Part of the street or highway system that serves as the principal roadway network for through traffic flow. | Major Street: | | | |
| | Minor Street: | | | |
| 2. Rural or suburban highway outside of, entering, or traversing a city. | Major Street: | | | |
| | Minor Street: | | | |
| 3. Appears as a major route on an official plan. | Major Street: | | | |
| | Minor Street: | | | |

CONCLUSIONS

Warrants Satisfied:

Remarks: _____

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2040 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010
 Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

Left-Turn Conflict Analysis

Condition satisfied when the product of the mainline left turns in one direction and the opposing traffic exceed the thresholds given.
 NOTE: This is not a signal warrant.

Applicable: Yes No
 Satisfied: Yes No

| No. of Left-Turn Lanes | A Peak Volume Left Turns | No. of Opposing Lanes | B Peak Opposing Volume in Same Hour | Product of peak left-turning vehicles (A) and opposing plus right-turn vehicles (B) | | Exceeded? | |
|------------------------|-----------------------------|-----------------------|--|---|-----------|--------------------------|--------------------------|
| | | | | A x B | Threshold | Yes | No |
| 1 | | 1 | | 0 | 80,000 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 | | 2 | | 0 | 100,000 | <input type="checkbox"/> | <input type="checkbox"/> |

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2014 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010

Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: Yes No
 Satisfied: Yes No

*Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
 Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.*

Condition A - Minimum Vehicular Volume

100% Satisfied: Yes No
 80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|----------------------------------|---|--------------|--------------|--------------|---------------------|-------|-----------|-------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 500 (400) | 350 (280) | 600 (480) | 420 (335) | 1,338 | 1,298 | 1,197 | 1,136 | 1,104 | 952 | 866 | 754 | | | | | | | | | |
| Highest Approach on Minor Street | 150 (120) | 105 (85) | 200 (160) | 140 (110) | 162 | 201 | 179 | 125 | 108 | 120 | 101 | 89 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: Yes No
 Excessive Delay: Yes No
 100% Satisfied: Yes No
 80% Satisfied: Yes No

| (volumes in veh/hr) | Minimum Requirements (80% Shown in Brackets) | | | | Eight Highest Hours | | | | | | | | | | | | | | | | |
|----------------------------------|---|--------------|--------------|--------------|---------------------|-------|-----------|-------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------|
| | | | | | 1 | | 2 or more | | 3:00 PM - | 4:00 PM | 4:00 PM - | 5:00 PM | 5:00 PM - | 6:00 PM | 7:00 AM - | 8:00 AM | 2:00 PM - | 3:00 PM | 8:00 AM - | 9:00 AM | 12:00 PM - |
| | 100% | 70% | 100% | 70% | | | | | | | | | | | | | | | | | |
| Both Approaches on Major Street | 750 (600) | 525 (420) | 900 (720) | 630 (505) | 1,338 | 1,298 | 1,197 | 1,136 | 1,104 | 952 | 866 | 754 | | | | | | | | | |
| Highest Approach on Minor Street | 75 (60) | 53 (40) | 100 (80) | 70 (55) | 162 | 201 | 179 | 125 | 108 | 120 | 101 | 89 | | | | | | | | | |

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

% Right Turns Included: 100 on north approach 0 on east approach
 100 on south approach 0 on west approach

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

YEAR: 2014

Engineer: Cara Abts
Date: February 2, 2010

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

- 1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
- 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

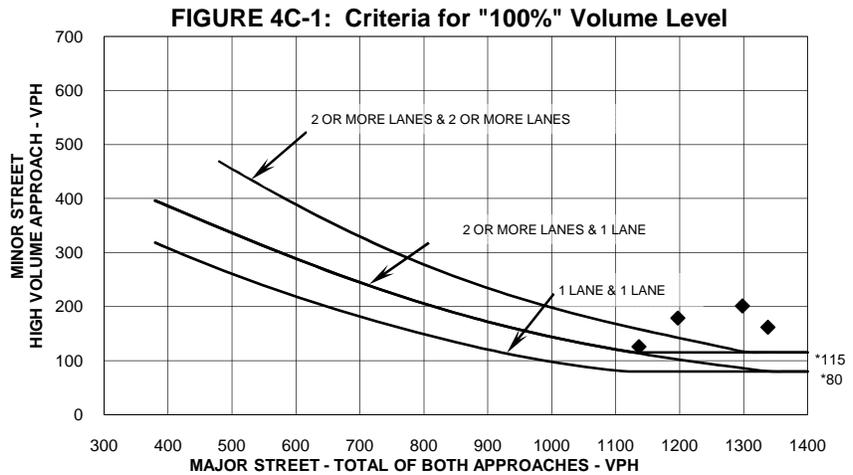
WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

Applicable: Yes No
Satisfied: Yes No

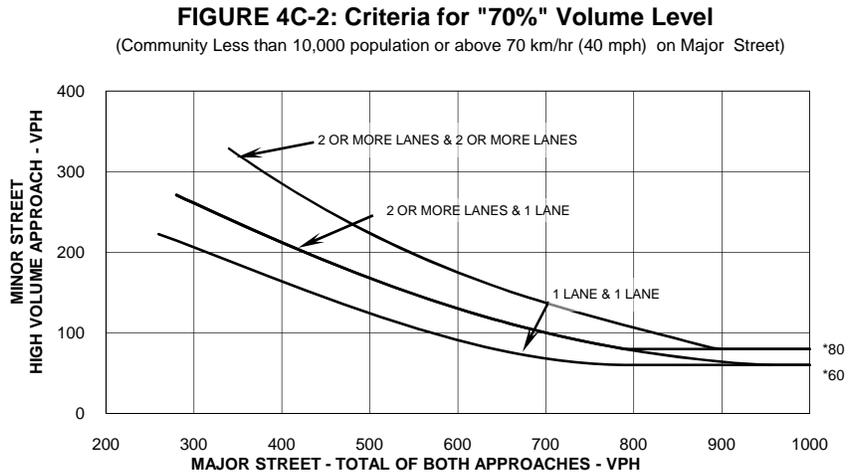
If all four points lie above the appropriate line, then the warrant is satisfied.

Plot four volume combinations on the applicable figure below.

| Four Highest Hours | Volumes | |
|--------------------|--------------|--------------|
| | Major Street | Minor Street |
| 3:00 PM - 4:00 PM | 1,338 | 162 |
| 4:00 PM - 5:00 PM | 1,298 | 201 |
| 5:00 PM - 6:00 PM | 1,197 | 179 |
| 7:00 AM - 8:00 AM | 1,136 | 125 |



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

EIGHT-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater
County: Walworth

YEAR: 2054

Engineer: Cara Abts
Date: February 2, 2010

Major Street: W Walworth Avenue
Minor Street: S Janesville Street

Lanes: 1 Critical Approach Speed: 25
Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 3 - PEAK HOUR

If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable: Yes No
Satisfied: Yes No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

| Peak Hour | | |
|-----------|-------|-----|
| 3:00 PM | 1,338 | 162 |

Criteria

1. Delay on Minor Approach *(vehicle-hours)

| | | |
|-----------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Delay Criteria* | 4.0 | 5.0 |
| Delay* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

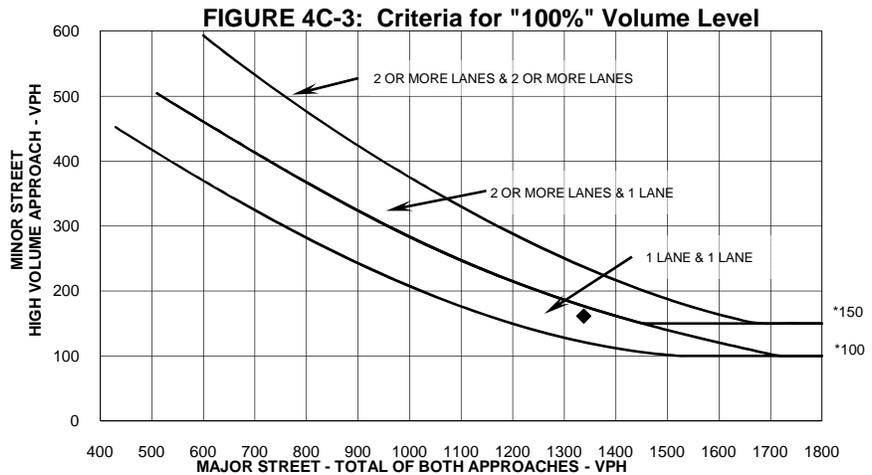
2. Volume on Minor Approach *(vehicles per hour)

| | | |
|------------------|------------------------------|-----------------------------|
| Approach Lanes | 1 | 2 |
| Volume Criteria* | 100 | 150 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

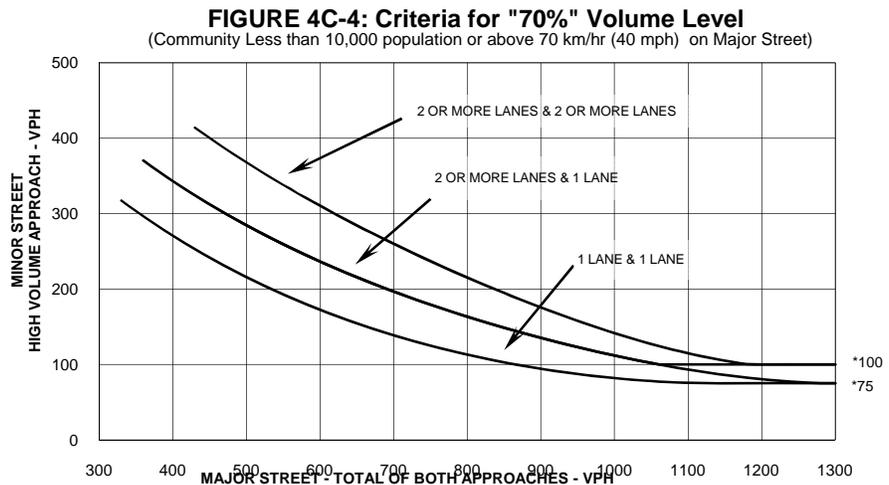
3. Total Entering Volume *(vehicles per hour)

| | | |
|-------------------|------------------------------|-----------------------------|
| No. of Approaches | 3 | 4 |
| Volume Criteria* | 650 | 800 |
| Volume* | | |
| Fulfilled?: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Plot volume combination on the applicable figure below.



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

EIGHT-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2054 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010
 Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

WARRANT 4 - PEDESTRIAN VOLUME

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if condition 1 or 2 is fulfilled and condition 3 is fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Hour | Pedestrian Volume | Pedestrian Gaps | Fulfilled? | |
|--|------|-------------------|-----------------|------------|----|
| | | | | Yes | No |
| 1. Pedestrian volume crossing the major street is 100 ped/hr or more for each of any four hours <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 2. Pedestrian volume crossing the major street is 190 ped/hr or more for any one hour <u>and</u> there are less than 60 gaps per hour in the major street traffic stream of adequate length. | | | | | |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | | | | |

WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Fulfilled? | |
|--|------------|-------|
| | Yes | No |
| 1. There are a minimum of 20 students crossing the major street during the highest crossing hour. | Students: | Hour: |
| 2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the crossing than the number of minutes in the same period. | Minutes: | Gaps: |
| 3. The nearest traffic signal along the major street is located more than 90 m (300 ft) away, or the nearest signal is within 90 m (300 ft) but the proposed traffic signal will not restrict the progressive movement of traffic. | | |

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft).

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Fulfilled? | |
|--|------------|----|
| | Yes | No |
| 1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning. | | |
| 2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation. | | |

EIGHT-HOUR WARRANT MET

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2014 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010
 Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Hour | Volume | Met? | | Fulfilled? | |
|---|---|--------|------|----|------------|----|
| | | | Yes | No | Yes | No |
| 1. One of the warrants to the right is met. | Warrant 1, Condition A (80% satisfied) | | | | | |
| | Warrant 1, Condition B (80% satisfied) | | | | | |
| | Warrant 4, Pedestrian Volume at 80% of volume requirements: | | | | | |
| | 80 ped/hr for four (4) hours or 152 ped/hr for one (1) hour | | | | | |
| 2. Adequate trial of other remedial measure has failed to reduce crash frequency. | Measure tried: | | | | | |
| 3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. period. | Number of crashes per 12 months: | | | | | |

WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Applicable: Yes No
 Satisfied: Yes No

| Criteria | Met? | | | Fulfilled? | | |
|--|---|------------------|-----|------------|----------|--|
| | Yes | No | Yes | No | No | |
| 1. Both of the criteria to the right are met. | a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour. | Entering Volume: | | | | |
| | b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3. | Warrant: | 1 | 2 | 3 | |
| 2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.) | | | | | ← Hour | |
| | | | | | ← Volume | |

| Characteristics of Major Routes | Met? | | Fulfilled? | |
|--|---------------|----|------------|----|
| | Yes | No | Yes | No |
| 1. Part of the street or highway system that serves as the principal roadway network for through traffic flow. | Major Street: | | | |
| | Minor Street: | | | |
| 2. Rural or suburban highway outside of, entering, or traversing a city. | Major Street: | | | |
| | Minor Street: | | | |
| 3. Appears as a major route on an official plan. | Major Street: | | | |
| | Minor Street: | | | |

CONCLUSIONS

Warrants Satisfied:

Remarks: _____

TRAFFIC SIGNAL WARRANT SUMMARY

City: Whitewater YEAR: 2054 Engineer: Cara Abts
 County: Walworth Date: February 2, 2010

Major Street: W Walworth Avenue Lanes: 1 Critical Approach Speed: 25
 Minor Street: S Janesville Street Lanes: 1

Left-Turn Conflict Analysis

Condition satisfied when the product of the mainline left turns in one direction and the opposing traffic exceed the thresholds given.

NOTE: This is not a signal warrant.

Applicable: Yes No
 Satisfied: Yes No

| No. of Left-Turn Lanes | A | No. of Opposing Lanes | B | Product of peak left-turning vehicles (A) and opposing plus right-turn vehicles (B) | | Exceeded? | |
|------------------------|------------------------|-----------------------|-----------------------------------|---|----------------|--------------------------|--------------------------|
| | Peak Volume Left Turns | | Peak Opposing Volume in Same Hour | A x B | Threshold | Yes | No |
| 1 | | 1 | | 0 | 80,000 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 | | 2 | | 0 | 100,000 | <input type="checkbox"/> | <input type="checkbox"/> |

APPENDIX C
OPINION OF PROBABLE CONSTRUCTION COSTS
(Note: Costs exclude utility relocations and right-of-way acquisition)

Walworth Avenue and Janesville Street - Opinion of Probable Construction Cost
February 1, 2010

1407.701

Walworth and Janesville Signals

| Major Item | Major Item Unit | Approx. Quantity | Approx. Unit Cost | Cost (Rounded) |
|--|-----------------|------------------|-------------------|-------------------|
| Excavation | CY | 250 | \$10 | \$ 3,000 |
| Base | Tons | 70 | \$10 | \$ 1,000 |
| Sidewalk | SF | 970 | \$3 | \$ 3,000 |
| Curb and Gutter | LF | 280 | \$10 | \$ 3,000 |
| Signals | Each | 1 | \$125,000 | \$ 125,000 |
| Subtotal | | | | \$ 135,000 |
| Technical Services and Contingency (40%) | | | | \$ 60,000 |
| Subtotal | | | | \$ 195,000 |

* A 40% allowance for contingencies and technical services was added due to the preliminary stage of the design.

Walworth Avenue and Janesville Street - Opinion of Probable Construction Cost
February 1, 2010

1407.701

Walworth and Janesville 3-Leg Roundabout

| Major Item | Major Item Unit | Approx. Quantity | Approx. Unit Cost | Cost (Rounded) |
|--|-----------------|------------------|-------------------|-------------------|
| Excavation | CY | 6510 | \$10 | \$ 66,000 |
| Base | Tons | 2280 | \$10 | \$ 23,000 |
| Sidewalk | SF | 7190 | \$3 | \$ 22,000 |
| Truck Apron | SY | 300 | \$35 | \$ 11,000 |
| Curb and Gutter | LF | 2600 | \$10 | \$ 26,000 |
| Concrete Pavement | SY | 3250 | \$35 | \$ 114,000 |
| Asphalt | Tons | 240 | \$75 | \$ 18,000 |
| Subtotal | | | | \$ 280,000 |
| Technical Services and Contingency (40%) | | | | \$ 120,000 |
| Subtotal | | | | \$ 400,000 |

* A 40% allowance for contingencies and technical services was added due to the preliminary stage of the design.

Walworth Avenue and Janesville Street - Opinion of Probable Construction Cost
February 1, 2010

1407.701

Walworth and Janesville

Realignment

| Major Item | Major Item Unit | Approx. Quantity | Approx. Unit Cost | Cost (Rounded) |
|--|-----------------|------------------|-------------------|-------------------|
| Excavation | CY | 7210 | \$10 | \$ 73,000 |
| Base | Tons | 2620 | \$10 | \$ 27,000 |
| Sidewalk | SF | 7550 | \$3 | \$ 23,000 |
| Curb and Gutter | LF | 2020 | \$10 | \$ 21,000 |
| Concrete Pavement | SY | 3960 | \$35 | \$ 139,000 |
| Asphalt | Tons | 380 | \$75 | \$ 29,000 |
| Subtotal | | | | \$ 312,000 |
| Technical Services and Contingency (40%) | | | | \$ 130,000 |
| Total | | | | \$ 442,000 |

* A 40% allowance for contingencies and technical services was added due to the preliminary stage of the design.

Walworth Avenue and Janesville Street - Opinion of Probable Construction Cost
February 1, 2010

1407.701

Walworth and Janesville

Multiway Stop

| Major Item | Major Item Unit | Approx. Quantity | Approx. Unit Cost | Cost (Rounded) |
|--------------------------------------|-----------------|------------------|-------------------|-----------------|
| Stop Sign | Each | 2 | \$130 | \$ 260 |
| Tubular Posts | Each | 4 | \$125 | \$ 500 |
| Stop Ahead (W3-1) | Each | 2 | \$225 | \$ 450 |
| All Way (R1-4) | Each | 4 | \$20 | \$ 80 |
| Pavement Marking Stop Line | LF | 48 | \$6 | \$ 290 |
| Pavement Marking Crosswalk | LF | 325 | \$5 | \$ 1,630 |
| Pavement Marking Centerline (4-Inch) | LF | 450 | \$3 | \$ 1,350 |
| Total | | | | \$ 4,560 |

**APPENDIX D
TRAFFIC COUNTS**

Start Date 11/11/2009
 Start Time 7:00
 Site Code 0

| Start Time | JANESVILLE ST--From North | | | | WALWORTH AUE--From East | | | | JANESVILLE ST--From South | | | | WALWORTH AUE--From West | | | | Peds | Peds |
|------------|---------------------------|------|-------|------|-------------------------|------|-------|------|---------------------------|------|-------|------|-------------------------|------|-------|------|------|------|
| | Left | Thru | Right | Peds | Left | Thru | Right | Peds | Left | Thru | Right | Peds | Left | Thru | Right | Peds | | |
| 6:00 AM | 1 | 7 | 5 | 0 | 1 | 2 | 1 | 0 | 5 | 24 | 1 | 0 | 6 | 1 | 2 | 0 | 56 | 56 |
| 6:15 AM | 0 | 17 | 1 | 0 | 0 | 0 | 1 | 0 | 14 | 26 | 0 | 0 | 8 | 2 | 6 | 0 | 75 | 131 |
| 6:30 AM | 1 | 16 | 6 | 0 | 0 | 3 | 1 | 0 | 11 | 53 | 0 | 0 | 13 | 1 | 15 | 0 | 120 | 251 |
| 6:45 AM | 1 | 23 | 7 | 0 | 0 | 3 | 1 | 0 | 13 | 44 | 1 | 0 | 20 | 1 | 10 | 0 | 124 | 375 |
| 7:00 AM | 2 | 42 | 13 | 0 | 1 | 1 | 5 | 0 | 15 | 34 | 1 | 0 | 10 | 3 | 4 | 0 | 131 | 450 |
| 7:15 AM | 1 | 25 | 39 | 0 | 0 | 1 | 2 | 0 | 43 | 48 | 0 | 0 | 6 | 1 | 10 | 0 | 176 | 551 |
| 7:30 AM | 1 | 29 | 39 | 0 | 0 | 9 | 5 | 0 | 40 | 72 | 1 | 0 | 19 | 2 | 30 | 0 | 247 | 678 |
| 7:45 AM | 2 | 32 | 14 | 0 | 0 | 5 | 5 | 0 | 34 | 70 | 1 | 0 | 20 | 5 | 21 | 0 | 209 | 763 |
| 8:00 AM | 0 | 28 | 14 | 0 | 0 | 3 | 3 | 0 | 15 | 48 | 1 | 0 | 14 | 2 | 14 | 0 | 142 | 774 |
| 8:15 AM | 2 | 29 | 14 | 0 | 2 | 3 | 1 | 0 | 19 | 66 | 0 | 0 | 15 | 4 | 12 | 0 | 167 | 765 |
| 8:30 AM | 0 | 28 | 13 | 0 | 1 | 7 | 4 | 0 | 23 | 87 | 1 | 0 | 10 | 3 | 11 | 0 | 188 | 706 |
| 8:45 AM | 3 | 17 | 7 | 0 | 2 | 6 | 5 | 0 | 25 | 59 | 2 | 0 | 15 | 0 | 13 | 0 | 154 | 651 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 509 |
| 9:15 AM | 2 | 27 | 7 | 0 | 1 | 4 | 4 | 0 | 15 | 41 | 0 | 0 | 4 | 2 | 10 | 0 | 117 | 459 |
| 9:30 AM | 2 | 24 | 7 | 0 | 0 | 4 | 7 | 0 | 7 | 47 | 0 | 0 | 14 | 2 | 14 | 0 | 128 | 399 |
| 9:45 AM | 2 | 29 | 8 | 0 | 1 | 2 | 2 | 0 | 15 | 47 | 1 | 0 | 9 | 3 | 8 | 0 | 127 | 372 |
| 10:00 AM | 5 | 33 | 6 | 0 | 1 | 2 | 3 | 0 | 4 | 34 | 1 | 0 | 7 | 2 | 14 | 0 | 112 | 484 |
| 10:15 AM | 1 | 36 | 8 | 0 | 0 | 4 | 3 | 0 | 15 | 32 | 0 | 0 | 7 | 3 | 11 | 0 | 120 | 487 |
| 10:30 AM | 5 | 38 | 12 | 0 | 0 | 3 | 3 | 0 | 10 | 40 | 0 | 0 | 12 | 4 | 10 | 0 | 137 | 496 |
| 10:45 AM | 2 | 33 | 10 | 0 | 1 | 7 | 7 | 0 | 17 | 53 | 2 | 0 | 5 | 7 | 14 | 0 | 158 | 527 |
| 11:00 AM | 3 | 31 | 5 | 0 | 2 | 3 | 2 | 0 | 4 | 28 | 4 | 0 | 10 | 8 | 13 | 0 | 113 | 528 |
| 11:15 AM | 3 | 28 | 6 | 0 | 0 | 5 | 3 | 0 | 12 | 28 | 1 | 0 | 11 | 2 | 14 | 0 | 113 | 521 |
| 11:30 AM | 0 | 23 | 6 | 0 | 1 | 2 | 2 | 0 | 20 | 28 | 2 | 0 | 8 | 2 | 7 | 0 | 101 | 485 |
| 11:45 AM | 5 | 54 | 20 | 0 | 0 | 3 | 1 | 0 | 13 | 49 | 0 | 0 | 21 | 0 | 21 | 0 | 187 | 514 |

AM Peak 4 114 106 0 18 15 132 238 3 59 10 75 PHF 0.783401

Truck % 4.46% 3.03% 1.07% 1.39%

Truck % Used 5% 3% 5% 3%

FORECASTED

2 percent per year for 10 years 1.2
 2 percent per year for 20 years 1.4

| | | | | | | | | | | | | |
|----------|---|-----|-----|---|----|----|-----|-----|---|----|----|-----|
| 10 years | 5 | 137 | 127 | 0 | 22 | 18 | 158 | 286 | 4 | 71 | 12 | 90 |
| 20 years | 6 | 160 | 148 | 0 | 25 | 21 | 185 | 333 | 4 | 83 | 14 | 105 |

Start Date 11/10/2009
 Start Time 13:00
 Site Code 0

| Start Time | JANESVILLE AVE--From North | | | | WALWORTH AVE--From East | | | | JANESVILLE AVE--From South | | | | WALWORTH AVE--From West | | | | Peds | Peds |
|------------|----------------------------|------|-------|------|-------------------------|------|-------|------|----------------------------|------|-------|------|-------------------------|------|-------|------|------|------|
| | Left | Thru | Right | Peds | Left | Thru | Right | Peds | Left | Thru | Right | Peds | Left | Thru | Right | Peds | | |
| 12:00 PM | 1 | 41 | 11 | 1 | 1 | 1 | 5 | 0 | 14 | 35 | 0 | 0 | 9 | 2 | 13 | 0 | 133 | 133 |
| 12:15 PM | 6 | 51 | 19 | 0 | 0 | 0 | 0 | 0 | 14 | 40 | 1 | 0 | 11 | 2 | 16 | 0 | 160 | 293 |
| 12:30 PM | 3 | 28 | 14 | 0 | 1 | 2 | 2 | 0 | 18 | 32 | 0 | 0 | 15 | 1 | 17 | 0 | 133 | 426 |
| 12:45 PM | 3 | 49 | 10 | 0 | 0 | 3 | 4 | 0 | 11 | 55 | 0 | 0 | 10 | 3 | 15 | 0 | 163 | 589 |
| 1:00 PM | 4 | 45 | 10 | 0 | 1 | 1 | 1 | 0 | 12 | 30 | 0 | 0 | 12 | 3 | 15 | 0 | 134 | 590 |
| 1:15 PM | 4 | 38 | 12 | 0 | 0 | 6 | 5 | 0 | 16 | 38 | 1 | 0 | 10 | 3 | 20 | 0 | 153 | 583 |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 450 |
| 1:45 PM | 3 | 65 | 7 | 0 | 0 | 2 | 5 | 0 | 17 | 52 | 0 | 0 | 12 | 5 | 24 | 0 | 192 | 479 |
| 2:00 PM | 1 | 44 | 15 | 0 | 1 | 7 | 1 | 0 | 13 | 42 | 0 | 0 | 16 | 4 | 21 | 0 | 165 | 510 |
| 2:15 PM | 3 | 43 | 16 | 0 | 1 | 1 | 2 | 0 | 10 | 46 | 1 | 0 | 10 | 5 | 15 | 0 | 153 | 510 |
| 2:30 PM | 2 | 93 | 30 | 0 | 1 | 0 | 4 | 0 | 18 | 40 | 1 | 0 | 13 | 1 | 21 | 0 | 224 | 734 |
| 2:45 PM | 4 | 66 | 29 | 0 | 0 | 6 | 1 | 0 | 20 | 43 | 1 | 0 | 8 | 0 | 15 | 0 | 193 | 735 |
| 3:00 PM | 1 | 77 | 26 | 0 | 1 | 2 | 1 | 0 | 25 | 49 | 2 | 0 | 23 | 6 | 39 | 0 | 252 | 822 |
| 3:15 PM | 2 | 69 | 10 | 0 | 1 | 5 | 1 | 0 | 19 | 39 | 1 | 0 | 12 | 4 | 32 | 0 | 195 | 864 |
| 3:30 PM | 5 | 90 | 25 | 0 | 0 | 3 | 4 | 0 | 15 | 51 | 1 | 0 | 22 | 2 | 28 | 0 | 246 | 886 |
| 3:45 PM | 1 | 75 | 38 | 0 | 1 | 2 | 5 | 0 | 24 | 56 | 3 | 0 | 12 | 4 | 22 | 1 | 243 | 936 |
| 4:00 PM | 4 | 61 | 29 | 0 | 1 | 4 | 4 | 0 | 19 | 31 | 2 | 0 | 15 | 7 | 32 | 0 | 209 | 893 |
| 4:15 PM | 4 | 56 | 31 | 0 | 1 | 8 | 2 | 0 | 29 | 56 | 5 | 0 | 19 | 10 | 36 | 0 | 257 | 955 |
| 4:30 PM | 3 | 87 | 26 | 0 | 2 | 11 | 7 | 0 | 18 | 44 | 2 | 0 | 19 | 6 | 35 | 0 | 260 | 969 |
| 4:45 PM | 3 | 58 | 24 | 0 | 1 | 5 | 1 | 0 | 27 | 64 | 0 | 0 | 22 | 8 | 23 | 0 | 236 | 962 |
| 5:00 PM | 2 | 85 | 29 | 0 | 0 | 3 | 5 | 0 | 20 | 52 | 1 | 0 | 15 | 8 | 32 | 0 | 252 | 1005 |
| 5:15 PM | 2 | 62 | 22 | 0 | 0 | 5 | 0 | 0 | 30 | 57 | 0 | 0 | 23 | 9 | 28 | 0 | 238 | 986 |
| 5:30 PM | 2 | 42 | 21 | 0 | 2 | 4 | 4 | 0 | 25 | 45 | 4 | 0 | 18 | 2 | 25 | 0 | 194 | 920 |
| 5:45 PM | 1 | 43 | 19 | 0 | 2 | 8 | 6 | 0 | 20 | 46 | 0 | 0 | 17 | 2 | 21 | 0 | 185 | 869 |

PM Peak 12 286 110 4 27 15 94 216 8 75 32 126 PHF 0.966346

Truck % 1.72% 0.00% 3.77% 0.43%

Truck % Used 5% 3% 5% 3%

FORECASTED

2 percent per year for 10 years 1.2
 2 percent per year for 20 years 1.4

| | | | | | | | | | | | | |
|----------|----|-----|-----|---|----|----|-----|-----|----|-----|----|-----|
| 10 years | 14 | 343 | 132 | 5 | 32 | 18 | 113 | 259 | 10 | 90 | 38 | 151 |
| 20 years | 17 | 400 | 154 | 6 | 38 | 21 | 132 | 302 | 11 | 105 | 45 | 176 |